Claim Amendments

Claims 1-39 cancelled.

40. (Currently amended) A method of assembling an electronic access control device having ~~a keypad and~~ a microprocessor-based control circuit including a microprocessor and a non-volatile memory for storing an ~~a manufacturer-inserted permanent~~ access code for controlling operation of the electronic access control device, comprising:

connecting to a communication port in the microprocessor-based control circuit, the communication port being ~~distinctive from the keypad and~~ connected to the microprocessor-based control circuit for accessing the non-volatile memory;

sending a read signal through the communication port to the microprocessor-based control circuit to trigger the microprocessor-based control circuit to transmit the access code stored in the non-volatile memory; and

receiving a transmission of the ~~reading the permanent~~ access code ~~back from the non-volatile memory~~ through the communication port by the microprocessor-based control circuit in response to the read signal.

41. (Currently amended) A method of entering a user-programmed access code into ~~an~~ a battery-powered electronic access control device having a keypad and a microprocessor-based control circuit including a microprocessor and a memory storing a ~~manufacturer-inserted~~ permanent access code, comprising;

pressing a program key on the keypad to trigger a transition of the microprocessor from a sleep mode with reduced power consumption into an operation mode and to indicate to the microprocessor initiation of a code programming operation, the program key being wired to one of multiple interrupt pins of the microprocessor;

immediately following the pressing of the program key, entering the permanent access code using alphanumerical keys on the keypad; and

after entering the permanent access code, entering the user-programmed access code using the alphanumerical keys of the keypad.

42. (Currently amended) A method of assembling an electronic access control device for mounting on a storage device, the access control device having ~~a keypad and~~ a microprocessor-based control circuit including a microprocessor and a non-volatile memory for storing a ~~manufacturer-inserted~~ permanent access code for controlling operation of the access control device, the method comprising:

installing the non-volatile memory in the microprocessor-based control circuit, the non-volatile memory not having said ~~manufacturer-inserted~~ permanent access code stored therein;

installing a communication port connected to the microprocessor-based control circuit for accessing the non-volatile memory~~, the communication port being distinctive from the keypad~~;

sending a write signal through the communication port to the microprocessor-based control circuit to indicate an access code is to be written into the non-volatile memory;

and

writing said ~~manufacturer-inserted~~ permanent access code to the non-volatile memory through the communication port.

43. (Currently amended) A battery-powered ~~An~~ electronic access control device comprising:

a keypad having at least one row of keys mounted thereon, including a program key, for pressing by a user to enter user input;

a microprocessor-based control circuit including a microprocessor and a non-volatile memory storing a ~~manufacturer-inserted~~ permanent access code, the microprocessor having multiple inputs for receiving an interrupt signal, and the program key of the keypad being connected to one of the multiple inputs, the microprocessor being programmed to enter a sleep mode to conserve battery power between operations;

the microprocessor-based control circuit being connected to the keypad for receiving user inputs entered through pressing the keys of the keypad, the microprocessor being configured to switch from the sleep mode into an operation mode and to immediately enter a code programming operation in response to ~~detect~~ a pressing of the program key, receive a first key code through the keypad in response to detecting the pressing of the program key, compare the first key code with the permanent access code in the non-volatile memory, receive a second key code through the keypad, and store the second key code in the volatile memory as an access code for the access control device if the first key code matches the permanent access code in the non-volatile memory.

44. (Previously presented) An electronic access control device as in claim 43, wherein the microprocessor is further configured to display an error message if it detects that the program key has been pressed out of sequence.

45. (Previously presented) An electronic access control device as in claim 43, wherein the keypad further includes a clear key, and the microprocessor is further configured to wait for a pre-selected period of time in response to detecting a pressing of the clear key.

46. (Previously presented) An electronic access control device as in claim 43, wherein the microprocessor is further configured to disable operation of the electronic access control device for a pre-selected period of time if the microprocessor has received a pre-selected number of invalid inputs consecutively entered through the keypad.

47. (Previously presented) An electronic access control device as in claim 43, wherein the microprocessor is further configured to generate an error message if it detects a lapse of a pre-selected time between two consecutive keypad key entries.

48. (New) A method as in claim 40, wherein the non-volatile memory contains a serial number for the electronic access control device stored therein, and further including the step of receiving a transmission of the serial number through the communication port.

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49. (New) A method as in claim 42, further including the step of writing a serial number for the electronic access control device into the non-volatile memory through the communication port.

50. (New) An electronic access control device comprising:

a microprocessor-based control circuit including a microprocessor and a non-volatile memory; and

a communication port connected to the microprocessor-based control circuit,

the microprocessor being programmed to receive a write signal through the communication port when the non-volatile memory does not contain a permanent access code for the access control device, receive a permanent access code through the communication port in

response to the write signal, and write the received permanent access code into the non-volatile memory.

51. (New) An electronic access control device as in claim 50, wherein the microprocessor is further programmed to receive a serial number for said electronic access control device and write the serial number into the non-volatile memory.

52. (New) An electronic access control device comprising:

a microprocessor-based control circuit including a microprocessor and a non-volatile memory containing an access code for the electronic access control device; and

a communication port connected to the microprocessor-based control circuit,

the microprocessor being programmed to receive a read signal through the communication port, and in response to the read signal transmit the access code in the non-volatile memory out through the communication port.

53. (New) An electronic access control device as in claim 52, wherein the non-volatile memory further contains a serial number for said electronic access control device, and wherein the microprocessor is further programmed to transmit the serial number through the communication port.

54. (New) An electronic access control device comprising:

a microprocessor-based control circuit including a microprocessor and a non-volatile memory containing a stored access code, the microprocessor having at least two interrupt inputs;

a battery for powering operation of the access control device;

a keypad having multiple keys connected to the interrupt inputs of the microprocessor, wherein pressing any key of the keypad sends an interrupt signal to the microprocessor through one of the interrupt inputs; and

a lock actuator operatively controlled by the microprocessor,

the microprocessor being programmed to receive an input access code through the keypad, compare the input access code with the stored access code in the non-volatile memory, and activate the lock actuator if the input access code matches the stored access code, the microprocessor being further programmed to enter a sleep mode between operations to conserve battery power and to switch from the sleep mode to an operation mode upon receiving an interrupt signal through one of the interrupt inputs.

55. (New) An electronic access control device as in claim 54 wherein the microprocessor-based control circuit includes a low-battery detection circuit that is enabled by the microprocessor in the operation mode for measuring a voltage of the battery and disabled when the microprocessor is in the sleep mode.

56. (New) An electronic access control device as in claim 54 wherein the lock actuator includes a solenoid control circuit for energizing a solenoid, the solenoid control circuit being controlled by the microprocessor and being enabled when the microprocessor is in the operation mode, the solenoid control circuit having first and second energized states controlled by a timer to energize the solenoid in the first energized state for a pre-selected first time interval at a first power level to move a plunger of the solenoid into a retracted position, and subsequently to energize the solenoid in the second energized state at a second power level to maintain the

plunger in the retracted position for a second pre-selected time interval, the second power level being non-zero and lower than the first power level.

57. (New) An electronic access control device as in claim 54 wherein the keypad includes a program key connected to one of the interrupt inputs of the microprocessor, and wherein the microprocessor is programmed to switch from the sleep mode to the operation mode and enter a code programming sequence in response to a pressing of the program key, receive a first input code from the keypad, compare the first input code with the stored access code in the non-volatile memory, receive an additional access code from the keypad if the first input code matches the stored access code, and store the additional access code in the non-volatile memory.

58. (New) An electronic access control device as in claim 54, further including a communication port connected to the microprocessor-based control circuit for sending an access code to the microprocessor-based control circuit for writing into the non-volatile memory to form the stored access code.

59. (New) An electronic access control device as in claim 58, wherein the microprocessor is programmed to receive a serial number for said electronic access control device through the communication port and write the serial number into the non-volatile memory.

60. (New) An electronic access control device as in claim 54, further including a communication port connected to the microprocessor-based control circuit, and wherein the microprocessor is programmed to receive a read signal through the communication port and in response to the read signal to transmit the stored access code through the communication port.

61. (New) An electronic access control device as in claim 59, wherein the non-volatile memory further contains a serial number for said electronic access control device, and wherein the microprocessor is further programmed to transmit the serial number through the communication port.

62. (New) An electronic access control device comprising:

a lock;

a solenoid coupled to the lock for opening and closing the lock;

a battery having a voltage for providing power to energize the solenoid;

a microprocessor-based control circuit including a driver circuit for energizing the solenoid and a timer, the control circuit controlling the driver circuit to supply a first amount of power from the battery sufficient to energize the solenoid to move a plunger of the solenoid into an open position to allow opening of the lock and then to supply a non-zero second amount of power from the battery that is lower than the first amount to energize the solenoid to hold the plunger in the open position until a preset time of about 3 seconds has elapsed as specified by the timer.

63. (New) An electronic access control device comprising:

a microprocessor-based control circuit;

a battery providing electrical energy at a battery voltage;

a voltage regulator receiving the battery voltage and generating a regulated voltage for powering the microprocessor-based control circuit; and

a low-battery detection circuit including a voltage divider having an input end connected to the battery voltage and an output end providing an output voltage, a first transistor in series with the voltage divider for controlling current flow through the voltage divider, a second transistor connected to the voltage divider such that the voltage divider switches an on/off state of the second transistor when the output voltage of the voltage divider falls below a predetermined voltage, the control circuit having a control line connected to a base of the first transistor for selectively turning the first transistor on and off, and a sensing line connected to an output end of the second transistor for sensing the on/off state of the second transistor.

64. (New) A method as in claim 42, further including the step of writing a command through the communication port into the non-volatile memory to disable the permanent address code for the electronic access control device.